

What Is Claimed Is:

1. A layer system including a silicon layer and a passivation layer (17) which is applied at least regionally to the silicon layer's surface, wherein the passivation layer (17) has a first, at least largely inorganic partial layer (14) and a second partial layer (15), the second partial layer (15) being made of an organic compound including silicon or containing such a material.
2. The layer system as recited in Claim 1, wherein the organic compound contains a halogen.
3. The layer system as recited in Claim 1 or Claim 2, wherein the organic compound is a silane, in particular an organic fluorine silane or an organic fluorochlorine silane, or a siloxane.
4. The layer system as recited in one of the preceding claims, wherein the organic compound has the general formula $R_a-R_b-Si(X)_{3-n}-(R_c)_n$, R_a being a perfluorinated polyether or a perfluorinated alkyl group having 1 to 16 carbon atoms, especially 6 to 12 carbon atoms, R_b and R_c being an alkyl group, and X being a halogen, an acetoxy group or an alkoxyl group, and n having a value of 0 to 2.
5. The layer system as recited in one of the preceding claims, wherein the first partial layer (14) is at least largely composed of an oxide layer, a silicon oxide in particular.
6. The layer system as recited in one of the preceding claims, wherein the first partial layer (14) has a thickness of 1 nm to 100 nm, 1 nm to 20 nm in particular.
7. The layer system as recited in one of the preceding claims, wherein the first partial layer (14) is directly applied to the silicon layer (11) or on a layer of silicon oxide situated on the silicon layer (11).
8. The layer system as recited in one of the preceding claims, wherein the second partial layer (15) is what is known as a "self-assembled monolayer."

9. The layer system as recited in one of the preceding claims, wherein the second partial layer (15) has a thickness of 0.5 nm to 30 nm, 5 nm to 20 nm in particular.
10. The layer system as recited in one of the preceding claims, wherein the passivation layer (17) is a layer which protects the silicon layer (11) with respect to an etch attack by a gaseous halogen fluoride, such as ClF_3 or BrF_3 .
11. The layer system as recited in one of the preceding claims, wherein the passivation layer (17) is free of micro-scale or nano-scale channels which are permeable for a gas, such as ClF_3 or BrF_3 or a vapor.
12. A method for creating a passivation layer on a silicon layer, in particular a layer system as recited in one of the preceding claims, a first, at least largely inorganic partial layer (14) being created at least in certain areas on the silicon layer (11) and a second partial layer (15), containing an organic compound including silicon or being made thereof, being created at least in certain areas on the first partial layer (14), the partial layers forming the passivation layer (17).
13. The method as recited in Claim 12, wherein, prior to applying the second partial layer (15), the surface of the first, inorganic partial layer (14) is hydrophilized at least in certain areas.
14. The method as recited in Claim 12 or 13, wherein an additional teflon-like coating is applied to the second partial layer (15).
15. Use of the layer system or the method as recited in one of the preceding claims for creating structures in silicon which are at least largely or regionally self-supporting, in particular by temporarily using an anisotropic etching technique in silicon and by temporarily using an isotropic etching technique in silicon.